

NOTES.

IN several districts of the south of England and Wales, coloured dust or sand accompanied a fall of rain on Sunday last, February 22. At Etchingham (Sussex), twelve miles from the sea, particles of dust deposited by the raindrops were left on the trees. At Swansea and other places in South Wales the puddles left by the rain were reddish in colour. Mr. A. E. Brunsden, the piermaster at Swanage, Dorset, noticed that a thick fog which occurred with the rain on Sunday morning had a peculiar yellowish tinge. On Monday morning the ironwork on the pier was found to be covered with a fine, salmon-coloured dust. Some specimens of dust collected after the fall have been sent to us by Mrs. Neville Ward, and are being examined.

IN reply to a question referring to afforestation in Ireland, Mr. Wyndham remarked in the House of Commons on Tuesday "Some of the recommendations in the report of the Committee on British Forestry are applicable, in principle, to Ireland. The Irish Department is at present conducting a special survey of existing woodlands and lands suitable for forestry operations. Such a survey is necessary to enable the Department to consider the measures to be adopted to give effect to the recommendations of the report in question."

DR. C. W. ANDREWS, of the British Museum, has arrived in Cairo, and started for the Fayum Desert, where, in conjunction with the officers of the Egyptian Geological Survey, it is hoped that he may be able to add largely to the collection of Eocene vertebrate remains from that district.

THE anniversary meeting of the Geological Society was held at Burlington House on Friday, February 20. The medals and funds, of which the awards have already been announced, (p. 250) were presented. The president delivered his anniversary address, which dealt with the relations of geology to its fellow-sciences.

REUTER reports that the following telegram from Honolulu has been received at San Francisco:—"Mr. Schroeder, Governor of Guam, Ladrones Archipelago, is here on his way home. He reports the occurrence of a severe and prolonged series of earthquakes, accompanied by loud rumblings, which have raised the level of the island by six inches."

At the annual general meeting of the Physical Society on February 13, Dr. R. T. Glazebrook, F.R.S., was elected president for the ensuing year. Mr. H. M. Elder has found it necessary to resign the office of secretary, and Mr. W. R. Cooper has been appointed his successor. In the course of an address delivered upon taking the presidential chair, Dr. Glazebrook said that the Society should have a wider range of activity, and technical papers should not necessarily be excluded. Interest might also be aroused by arranging at times for set discussions. Attempts should be made to give advice and guidance to physicists in isolated positions about the country having time to carry out research. The address also dealt with the history of theoretical optics during the last sixty years, and the part taken by the late Sir George G. Stokes in its development.

At the meeting of the Royal Astronomical Society on February 13, the Society's gold medal was awarded to Prof. Hermann Struve, director of the Königsberg Observatory, for his work on the satellites of Saturn, published in 1898 in the publications of the Central Nicolas Observatory, Pulkowa. Prof. Turner delivered an address describing the long series of observations and the complex and laborious calculations by which Prof. Struve had determined the motions and masses of the satellites, the position of the equator of Saturn, the compression of the body of the planet,

the mass of the ring, &c. The address concluded with a mention of the fact that half a century ago the gold medal had been awarded to Prof. Struve's grandfather, and a quarter of a century ago to his father, who still lives, one of the Society's oldest associates. At the conclusion of the address the chairman handed the medal to Count von Bernstorff, Councillor of the German Legation, for transmission to the medallist.

THE annual general meeting of the Institution of Mechanical Engineers was held on February 20, when the annual report of the council was presented. The report points out that the completion of his sixth report to the alloys research committee has been delayed by the death of Sir William Roberts-Austen, but a large amount of his experimental work, dealing with the tempering of steel, and also with alloys of the industrial metals, is available, and is now being dealt with by the committee. No further report will be made by the gas-engine research committee until the large experimental engine has been put to work at the Birmingham University. Prof. T. Hudson Beare has been occupied at the University of Edinburgh in perfecting the apparatus for testing the value of the steam-jacket. Prof. David S. Capper has now concluded his experiments at King's College upon jacketed and unjacketed steam cylinders, and a report upon his comprehensive experiments is almost completed. The question of the standardisation of flanges has received the attention of the council, and was dealt with at the April meeting in a paper by Mr. R. E. Atkinson. A considerable number of members and others have since sent in contributions bearing on the best forms to be adopted as standards. The engineering standards committee, the constitution of which was explained in the last annual report, has held frequent meetings during the year, and its recommendations relating to standard sizes for rolled sections will be published shortly.

MR. HANBURY, Minister of Agriculture, addressing the Lancashire Farmers' Association at Preston on February 21, said he understood that the Department of Fisheries was to be added to the Board of Agriculture.

DR. DEMPWOLFF, who succeeded Prof. Koch as head of the German expedition for the investigation of malaria in German New Guinea, states, according to the Berlin correspondent of the *Standard*, that he has discovered an aquatic insect which destroys the *Anopheles* mosquito. He proposes to cultivate these insects by artificial means, and in this way hopes to exterminate the malaria mosquito.

THE French Chamber of Deputies has recently adopted a Bill intended to create a nickel coin in France. *La Nature* states that to prevent confusion with the silver franc the new nickel coin of 25 centimes will weigh seven as against the five grammes of the franc; the edge of the nickel coin will not be fluted like the silver franc; the new coin will be half as thick again as the franc. At first 16 million pieces will be struck off, and this will require 112,000 kilograms of nickel.

THE "Life and Letters of Thomas Henry Huxley," by his son, Mr. Leonard Huxley, first published by Messrs. Macmillan and Co., Ltd., in 1900, and reviewed by Sir W. T. Thiselton-Dyer, K.C.M.G., in *NATURE* for June 13, 1901, has been reissued in three volumes in the well-known "Eversley" series at 12s. net. The opportunity afforded by the publication of a second edition has been taken to correct various misprints, and to rectify a few errors and omissions in the first edition. In its cheaper form the book is sure to renew its popularity, and to reach a wider circle of Huxley's admirers.

THE Royal Academy of Sciences of Turin announces that one of the Vallauri prizes will be awarded by the Academy to the man of science, without distinction of nationality, who, from January 1, 1907, to December 31, 1910, shall have published the most important and most celebrated work in the domain of the physical sciences—these words being used in their broadest sense. The amount of the prize is 30,000 Italian pounds net. The prize will be awarded a year after the result has been announced. Works submitted to the Academy will not be returned, and manuscripts will not be considered.

SPEAKING at Dorchester on Monday, at the opening of a new operating theatre, Sir Frederick Treves said that the ceremony that day represented a movement the magnitude of which it was not at first easy to appreciate. Twenty-five years ago that part of surgery which dealt with operations was more or less discredited. It was singularly disappointing and, he was sorry to say, singularly unsuccessful. The amount of work that was then done through operations was comparatively small. The great development that had taken place was all due to the introduction, by Lord Lister, of antiseptic surgery, which had rendered operative treatment possible. The result had been the saving of many thousands of lives annually, and the rescue of still more thousands from a state of hopeless illness. The performance of important operative surgery was no longer limited to London and a few great cities; operative surgery had spread all over the country, and now nearly every provincial hospital had its own operating theatre. It was all part of a general movement which would result in bringing medical and surgical science to a higher level than had ever before been attained in this country.

THE *Natal Mercury* of January 9 last states that a meteorological institute has been established at Bloemfontein. Substations are being started in Harrismith, Kroonstad, Heilbron, Bethlehem and Bethulie, and records from all points will be sent to Bloemfontein. Observations taken so far promise very interesting study, and show remarkable variations of conditions throughout the Orange River Colony, both as regards one part in relation to others, and in daily changes at some stations. Such systematic study of meteorological conditions as this will very soon be of practical benefit to agriculture in this colony.

A REUTER message from St. Petersburg states that the Imperial Academy of Science has decided to dispatch an expedition to search for Baron Toll, who left Siberia in June last with a few companions to explore Bennett Island, and has not been heard of since. The search expedition, which will be headed by Lieutenant Koltchak, who was with Baron Toll before he left the Siberian coast, will proceed shortly to New Siberia and, if necessary, to Bennett Island, as there is reason to believe that the baron, seeing his road back to New Siberia cut off by the breaking up of the ice towards the middle of July last, remained in the island to pass the winter.

THE New York correspondent of the *Daily Mail* reports that the first detailed announcement of the plans of the Rockefeller Institute, founded by Mr. John D. Rockefeller with an endowment of 40,000*l.* two years ago, has been made public. Mr. Rockefeller added 200,000*l.* to the endowment last summer. It is expected that his contributions will ultimately reach a total of two and a half million pounds. Mr. Simon Flexner, of the University of Pennsylvania, has been chosen to take charge of the work, which will be centred in New York. A research laboratory will be opened in October. Then will follow a hospital, where special groups of patients will be treated in order to develop new

methods of practice. The programme also includes the publication of a journal of experimental medicine and the creation of a popular hygienic museum. Several physicians have already been sent to Europe to make special researches.

THE Savage Club entertained Mr. Marconi on Saturday evening, February 21. Mr. Henniker Heaton, M.P., occupied the chair, and among the visitors were the Marquis of Dufferin and Ava, the Earl of Malmesbury and Sir Charles Boxall. In responding to the toast of his health, Mr. Marconi said he demurred to the statement of the chairman that he had been neglected in England. Like the King of Italy, the King of England had been most kind to him, and for three weeks he, by desire of His Majesty, carried on experiments in His Majesty's yacht *Osborne* which greatly advanced the development of wireless telegraphy. He then traced his work and the opposition he had met with, step by step, from the cable companies. The Canadian Government had given him substantial assistance and a grant of money to carry on his work. The Italian Government had just passed a Bill to erect the largest Marconi wireless telegraph station in the world, to communicate with America. In conclusion, he made the announcement that he had just made an arrangement with a great daily newspaper in London to supply it with a wireless message every day from Canada.

THE Postmaster-General, in reply to a question on wireless telegraphy put by Mr. H. Samuel last Thursday, stated that the effect of recent progress on the commercial and strategic interests of the country was receiving careful attention, and that he was in communication with the Marconi Wireless Telegraph Co. on the subject of its relations with the Post Office. "I am not at present in a position," he added, "to make any final statement on the subject, but I have no doubt it will be possible to secure for the public of this country the use of this method of communication when it is sufficiently developed for commercial purposes." Contrast with this the attitude of the Italian Government, which has just passed a Bill for establishing a powerful wireless telegraphic station in Rome, which was introduced by the Minister of Posts and Telegraphs. The Senate passed a resolution expressing its great satisfaction with the statement of the Minister, and conveying congratulations to Mr. Marconi. It is proposed to make this new station the largest yet built, and it is hoped by its means to establish communication with Argentina and with all the existing long-distance stations.

A NEW form of electric heating apparatus has been invented by Mr. E. G. Rivers, of H.M. Office of Works. The radiator is constructed of a layer of finely powdered retort carbon held between enamelled iron plates and kept in position by asbestos cardboard. Three copper strips are led in, one at the centre and one at each end, and continuous current passed from the centre strip to the outer two. The current taken is about eight amperes at 200 volts, and with this a heating surface of 25 square feet can be maintained at an average temperature of 190° F. The manufacture of this radiator is, we understand, to be undertaken by the Electric and Ordnance Accessories Co., of Birmingham.

ACCORDING to last week's *Daily Mail*, the sharp frost in New York produced some startling effects on the elevated electric railway. There had been rain before the frost, as a result of which the centre rail had become coated with ice, and this led to sparking on a large scale. The effect appears to have been somewhat extraordinary if we may judge from the account given by the *Daily Mail's* correspondent, who writes as follows:—"Dazzling flashes of flame shot high into the air, the reflection in the sky strongly

resembling the Aurora Borealis. Every train resembled a blazing comet, being followed by a long stream of flame and sparks. The whole line glistened with beautiful electrical discharges. Thousands of persons walked the streets watching the strange spectacle." This seems to open out fresh possibilities for electric railways in catering for the public.

THE preliminary account of the international balloon ascents of December 4, published by Dr. Hergesell, show that France, Germany, Austria, Italy, Russia and the United States (Blue Hill) took part in the experiments. Both manned and unmanned balloons and kites were used; the highest altitudes attained were:—Itteville (near Paris), 14,823 metres, lowest temperature $-52^{\circ}9$ C., temperature on the ground $-4^{\circ}8$; Strassburg, 16,500 metres, minimum temperature $-65^{\circ}2$, on the ground $-7^{\circ}8$; Berlin, 14,465 metres, temperature -35° , on the ground $-11^{\circ}5$, the lowest temperature was $-46^{\circ}7$ at an altitude of 9670 metres; Pavlovsk, 17,700 metres, the lowest temperature was recorded at 11,220 metres, $-63^{\circ}5$, on the ground $-20^{\circ}7$; at Blue Hill the wind was not strong enough to raise the kite higher than 1100 metres; an inversion of temperature occurred at the height of 1000 metres. The European ascents were made in an area of high barometric pressure.

Symons's *Meteorological Magazine* for February contains the first of a proposed series of articles on the Canadian climate, by Mr. R. F. Stupart, director of the Meteorological Service of Canada. These articles bid fair to be of considerable interest, and will dispel the popular idea that Canada is an exceedingly cold country. Ordinary readers may not at first realise that a large portion of Ontario lies as far south as the south of France, that Toronto is further south than Florence, and that the southern point of Ontario is further south than Rome. Referring to Vancouver, the author points out that the rainfall along the exposed western coast exceeds 100 inches, but in the more eastern districts it is less than half that amount. "The mean monthly and annual temperatures correspond very closely with those found in parts of England; the summers are quite as long, and severe frost scarcely ever occurs." Crossing to the mainland, about 70 miles from Vancouver, the observations taken at an experimental farm give the mean temperature of January as 33° , and of July 64° ; the lowest temperature on record is -13° , and the highest 97° . Further eastward the summers are warmer and the winters are colder, but bright, dry weather is the rule. In the prairie country the winters are at times very cold, but the air being dry, a temperature of -20° causes no inconvenience to ordinary daily avocations, and early in May the prairies are carpeted with flowers.

MR. L. H. MURDOCH describes (*Monthly Weather Review*, October, 1902, vol. xxx. No. 10) some interesting facts relative to the variation of precipitation at Salt Lake City, the water-level of the Great Salt Lake and some rainfall records from other localities in the States. The curves which he gives in the paper show a good agreement between the variation of the rainfall and the level of the lake, which led him to deduce that from 1827 to 1864 there was a dry cycle, from 1865 to 1886 a wet cycle, and from 1887 to the present time another dry cycle. To investigate the universality of these dry and wet periods he examined several American stations of about the same latitude. He found that the country west of the Rocky Mountains had its wettest cycle from 1866 to 1887, while the middle Mississippi and Ohio valleys had their heaviest precipitation from 1840 to 1859; thus, while the central portion of the country was receiving abundant rainfall, the west of the Rocky Mountains experienced "the longest dry cycle of which we have any record." At the present time, from San Francisco to

Baltimore a dry cycle is in progress, and it is stated that "the past fifteen years have been the driest fifteen consecutive years on record for all the stations named, except Sacramento, and the drought is equally well marked there, but the fifteen years from 1851 to 1865 were a trifle drier." Mr. Murdoch examined the sun-spot curve to see if he could trace any connection between these periods of wetness and dryness, but he found none, years of minimum spots being sometimes excessively wet and sometimes excessively dry, and the same for the years of maximum sun-spots. How long will the present dry cycle continue? he asks, and he points out that a correct answer to this question would be worth millions of dollars to the people of the United States.

IN No. 13 (1902) of the *Annalen der Physik*, Herr Hans Lehmann publishes a list of the wave-lengths of the iron spectrum between λ 6811'30 and λ 8690'98, which should prove a useful standard of reference for wave-lengths in this region. Referring to Sir William Abney's conclusion that there is an upper limit to the spectra of certain metals, which the latter photographed during his experiments on the ultra-red region, Herr Lehmann states that his own experiments tend to confirm this conclusion.

PROF. J. TROWBRIDGE, who has been studying powerful electric discharges from condensers through hydrogen contained in silica-glass vacuum tubes, finds that by using this material for his tubes he can obtain and examine the most intense light yet studied in a laboratory (*Electrical Review*, November 22, 1902). His experiments show that to the eye the light of hydrogen appears to give a continuous spectrum, though photography reveals many bright and dark lines in the ultra-violet. Prof. Trowbridge considers that his results have an important bearing upon theories of the nature and constitution of stars and of the sun's spectrum, and that they open a new field in spectrum analysis.

AT Brescia in September, 1902, the Seismological Society of Italy held its first congress. An account of the proceedings, which extended over five days, and were largely devoted to seismometry, the Society publishes in its *Bulletin*, Nos. 4 and 5, vol. viii. One important discussion referred to the rate at which recording surfaces should be moved. Experience suggests that the speed to be adopted depends very largely upon the character of the earthquakes which are being studied. With earthquakes of local origin, waves with a period of $1/20$ or $1/10$ of a second may occur, whilst earthquakes of distant origin consist of waves which vary in period from 5 to 60 seconds. To obtain an open diagram of the former, the speed required for the recording surface should be so very much higher than for the latter that it would seem necessary to employ different types of apparatus for different types of earthquakes. Other discussions related to the form of unfelt seismic waves, modifications of the Rossi-Forel scale, the probable value of continuous determinations of the value of g in the vicinity of volcanoes, the establishment of a magnetic observatory in Sestola, to seismic periodicities and to other subjects. Many instruments and diagrams were exhibited, and under its able president, Prof. Pietro Tacchini, the Society is to be congratulated on the encouragement it has given to seismic research.

WE have received a paper by Father Algué, S.J., director of the Philippine Weather Bureau, on ground temperature observations at Manila. Underground temperatures have been regularly observed in Manila since the year 1895, with four thermometers placed 59'06 in., 29'53 in., 17'72 in. and 13'78 in. below the surface of the ground, and more recently three more have been added at depths of 9'84 in., 19'68 in.

and 39°38 in. Discussing the temperatures at 19°68 in. and 39°38 in. in detail, Father Algué finds that at the former depth the minimum of the year falls in December and the maximum in May; the minimum of the day occurs at 6 a.m., a secondary minimum at noon, and the maximum about 10 a.m. The daily range varies from about 6° C. in April to about 3° C. in the coldest months of the year; temperature is nearly constant from midnight to 6 a.m. At a depth of 39°38 in. the minimum temperature usually falls in December and the maximum in May; a large oscillation takes place from about 6 a.m. to 10 a.m., followed by a slight descent until 11 a.m.; from January to May temperature remains low to about 4 p.m., rises slightly until 5 p.m., and then remains steady all night until 6 a.m.

THE affective quality of auditory rhythm is the subject of a paper by Mr. Robert MacDougall in the *Psychological Review* for January, which deals more particularly with the external conditions of pleasurable or painful feeling in rhythm. Mr. MacDougall considers that the qualities of a rhythmical sequence which render it gay or restful are not attributable to secondary associations, but to the rhythm itself, and in particular to a relation of agreement between the rate of the rhythm and the prevailing mood of the observer. Variations in intensity of the rhythmical element are much less marked in their effect than variations of tempo. In regard to the proportion between the lengths of the various elements within the rhythm, it is found that those forms are the most pleasing in which the accentuated element is lengthened (as is commonly done in the recital of music or poetry), but a marked difference exists between trochaic and dactylic forms. In the former, equality of the two elements is the least pleasing form, while inverted types in which the unaccented element is lengthened have a peculiar character of their own which produces an agreeable sensation. In the dactylic form, the inversion of the intervals so as to give greater length to the unaccented element produces a more displeasing effect than absolute uniformity. The feeling of monotony when a rhythm is repeated is attributed to the tendency to differentiate between successive groups, and to combine them into larger rhythmical unities. The pleasure derived from pure rhythm is more marked in music than in poetry, where its continuity is continually interrupted by the stream of images aroused by the articulate sounds which support it.

MR. W. R. OGILVIE GRANT, of the Natural History Museum, has started on a collecting expedition to the Azores. Such an excellent all-round collector ought to obtain many novelties.

THE case of "recent additions" in the central hall of the British Natural History Museum contains an interesting series illustrative of burrowing animals. The exhibit at present includes a number of mammals, such as the common mole, star-nosed mole, golden moles, sand-moles, naked sand-rat, marsupial mole and duckbill, together with various burrowing snakes, beetles, molluscs, &c., as well as one species of bird.

IN *Naturwissenschaftliche Wochenschrift* of February 8 Dr. von Linden concludes his paper on the markings of animals, making special reference to the effects of change of temperature on those of the Lepidoptera, and pointing out that by means of such variations what are practically new species may be artificially produced.

IN the course of the second part of his article on the nests of bees, published in the *Biologisches Centralblatt* of February 1, Dr. von Buttel-Reepen publishes a phylogenetic table of the Apidæ, in which the honey-bees (Apinæ) and

the stingless bees (Meliponinæ) are regarded as forming diverging branches from the ancestral humble-bees (Bombinæ).

IN response to a suggestion of Prof. Bardeleben, to the effect that a fresh study of the anatomy of generalised types of the different groups of vertebrates could scarcely fail to lead to good results, Dr. H. H. Wilder undertook the detailed examination of the skeleton of the American spotted salamander (*Necturus maculatus*). The result of his work, with numerous illustrations, forms vol. v., No. 9, of the *Memoirs* of the Boston Natural History Society.

IN a note in vol. xxvi. of the *Proceedings* of the U. S. National Museum, Mr. M. W. Lyon records the interesting fact that the females of the American bats formerly known as *Atalapha*, but now generally termed *Lasiurus*, are furnished with two pairs of mammae, and generally produce from three to four young ones at a birth. A photograph of a female of the common North American *L. borealis*, with four young, is reproduced. Later on in the same volume Dr. L. Stejneger records the rediscovery of the *Salamandra quadrimaculata* of Holbrook, which inhabits Georgia and the Carolinas, and is entitled to rank as a distinct species of the genus *Desmognathus*.

THE *Irish Naturalist* for February records the breeding of that essentially Arctic bird, the red-necked phalarope, in the west of Ireland. In a series of notes on the birds of the Outer Hebrides, published in the *Annals of Scottish Natural History* for 1902 and January, 1903, Mr. J. A. Harvie-Brown adds the same species, together with the lesser tern, the pochard and the scaup-duck to the list of birds breeding in those islands. Mr. Brown mentions that although about 25,000 sea-birds of various kinds are annually killed by the islanders for food, yet this slaughter has no perceptible effect on the numbers of the feathered inhabitants of the islands. On the contrary, fulmar-petrels are steadily on the increase, and annually extending their breeding range.

THE *Emu* for January contains the presidential address of Colonel Legge read before the congress of the Australasian Ornithologists' Union. Reference is made to the good work done by the members of the Union, and especially to the success which has attended their official journal, the *Emu*. It is hoped that before long means may be found of illustrating that periodical, when necessary, with coloured plates. One of the most important papers to which the president referred is Mr. Le Souëf's note on the feathers of the emeu, in which it was pointed out that although the barring characteristic of the nestling plumage usually vanishes in the first year, yet that it occasionally reappears. Regret was expressed that the Tasmanian emeu, which probably belonged to a distinct race, was allowed to be exterminated before its characteristics were described. An excellent plate of a little penguin, with young, on its nest, forms a feature of the January number.

IN a paper on the Coleoptera of Colorado, published in vol. v., No. 3, of the *Bulletin* of the Iowa University, Mr. H. F. Wickham makes the following general remarks:—"The phenomena of distribution in Colorado are of much interest. Within a radius of a few miles we may find assemblages of species representing at least three distinct faunæ. The first, that of the great plains surrounding the mountains, is marked by a great development of wingless or imperfectly winged forms, probably largely invaders from the south, where we may suppose that the arid deserts first made their appearance, and where this characteristic feature is more in evidence among the beetles. . . . Occasionally these forms leave their natural haunts and extend for long

distances up the river valleys. . . . As we enter the timbered country on the higher foot-hills and lower mountain sides, we encounter a fauna which, while not unmixed with species that have come up from the plains, shows a strong affinity to the life about our Great Lakes. Higher still—from about 8000 to 9000 feet—we meet with species of genera still more boreal in their habits. . . . Above timber line the peaks sustain a few beetles which seem to be of Arctic origin, left probably by the retreating ice-sheets of the Glacial period."

IN the January issue of the *Journal of Anatomy and Physiology*, Dr. Tims discusses the evolution of the cheek-teeth of mammals. In the development of the premolar series it is considered that the increase or suppression of the cusps of the cingulum has played a part. The molars appear to have attained complexity by the fusion of two or more simple teeth in the same line. The molars of a rabbit represent a simple type, in which two cones, with their cingulum, have been fused. In most rodents two cones seem to be involved, although in the water-vole four may be united. The two outer cusps on the upper molar of a dog represent two elements united by fusion, and the evolution of the molars of ruminants is believed to run on parallel lines. The author adopts the concrescence theory of dental evolution, so far as it relates to fusion in the molars of cones situated in the same line; but is unable to find evidence of fusion out of this line, and cannot accept the view that cones of two dentitions are represented in the molars.

THE London Stéréoscopic Company has sent us a list of cameras, lenses, optical lanterns and other apparatus connected with photography which are offered for sale at greatly reduced prices in order to make room for new articles. Opportunity is thus afforded for obtaining or supplementing a photographic outfit at much less than the usual cost.

THE February number of the *Parents' Review*, the monthly organ of the Parents' National Educational Union, contains two articles treating of two distinct branches of nature-study. The first, on "The Boughs of the Branstock," by Mr. W. G. Collingwood, deals with the pictorial representation of trees in an artistic manner; the second, "A Plain Account of a Kerry Potato-patch," by Miss E. A. Magill, describes certain experiments designed to test what could be done by one individual with the least possible capital in the cultivation of a kitchen garden.

IN pursuing his researches on the emanations from radioactive bodies, M. Henri Becquerel has recognised that the rays given off by polonium are identical with the *Kanalstrahlen* of Goldstein. In the current number of the *Comptes rendus*, M. Becquerel classifies the various rays as follows:—Uranium emits only one kind of radiation, charged with negative electricity and possessing high penetrating power. The emanation from polonium is charged with positive electricity, and is very easily absorbed, whilst the emanation from thorium and radium contains both kinds of rays.

THE additions to the Zoological Society's Gardens during the past week include an Agile Wallaby (*Macropus agilis*), a Brush Turkey (*Talegalla lathamii*), a Frilled Lizard (*Chlamydosaurus kingi*) from Australia, presented by Mr. H. W. Fawdon; a Two-spotted Paradoxure (*Nandinia binotata*) from West Africa, presented by Mr. C. W. Wilson; two Red-sided Tits (*Parus varius*), European, presented by Mr. Howard Williams; a Chimpanzee (*Anthropopithecus troglodytes*) from West Africa, three Coquerel's Mouse Lemurs (*Chirogaleus coquereli*) from Madagascar, three Bearded Lizards (*Amphibolurus barbatus*), a Blue-tongued Lizard (*Tiliqua scincoides*) from Australia, two Black-headed Buntings (*Emberiza melanocephala*), European, deposited.

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OUR ASTRONOMICAL COLUMN.

PHOTOGRAPHS OF THE NORTH POLAR REGION.—In the February number of the *Bulletin de la Société astronomique de France*, M. Flammarion gives an interesting description, embodying a catalogue of positions and several charts, of a series of photographs of the region surrounding the North Celestial Pole. The article describes the obtaining of the photographs and also shows how they indicate very clearly the movement of the pole among the surrounding stars during short intervals of time. In the catalogue, 356 stars, all within 2° of the pole, are arranged in the order of their North Polar distances on September 3, 1902, and their magnitudes, coordinates and numbers in the Redhill (Carrington's 1857) catalogue of circumpolar stars are also given. The charts show the movement of the pole among these stars during the period 1600 to 2200 A.D., and that Polaris, which is at present No. 129 in the catalogue, will attain its minimum N.P.D. in the year 2104.

A DEVICE FOR OBTAINING GOOD SEEING.—In a paper communicated to the *American Journal of Science* for February, Prof. S. P. Langley describes a novel device which he has found efficient in producing steady images of the sun and stars when observed with the reflector of the Smithsonian Astrophysical Observatory, and he believes that it will have the same effect when used with refractors.

Generally the point aimed at in previous attempts to obtain "good seeing" has been to abolish all air currents in and about the telescope tube, but Prof. Langley has found by experiment that the definition is very little improved when this course is followed. After various experiments at different altitudes he arrived at the conclusion that it is the air within a few hundred yards, or even feet, of the telescope that has the greatest disturbing effect, and he endeavoured to find some method of tranquillising this. The reflector he was using was fed by a coelostat, and he caused the reflected beam to pass through a long three-walled tube which was covered by a canvas tent, so that the contained air was thoroughly well insulated from the variations of temperature and the draughts in the surrounding atmosphere. Very little relief was found as a result of this arrangement, so Prof. Langley tried an experiment of a somewhat paradoxical character, which he found to answer very well. He drew a strong current of air through the inner tube and introduced cross currents by several inlets at various points in the length, thereby thoroughly agitating and mixing the enclosed air. Taking some artificial double stars for his objects, he found that doubles which were blurred and inseparable under the former condition were plainly visible and sharply separated when the air was thus agitated. When the sun was observed under the new conditions it was found that the "boiling" on the limb, which is normally so annoying to the observer, was very nearly abolished. No quantitative results are yet ready for publication, but Prof. Langley has no doubts as to the general advantages to be obtained from the application of his method.

PROPER MOTION OF THE SUN COMPARED WITH STELLAR VELOCITIES.—In a paper communicated to Section A of the American Association for the Advancement of Science, Profs. Frost and Adams, of Yerkes Observatory, give the results they have obtained, using the Bruce spectroscope, of the radial velocities of twenty stars having spectra of the Orion type. The table of radial velocities included in the paper shows that of all the stars considered, those between 3 hours and 7 hours R.A. have a positive motion, i.e. they are receding, whilst those in the opposite region of the heavens, 16 hours to 20 hours R.A., have a negative motion, i.e. they are approaching. This difference is chiefly due to the velocity of the proper motion of the sun, and if the amount of this motion be subtracted from the values obtained, the remaining proper motions of the stars are very small, scarcely any of them having such great velocities as that of the sun.

DISCOVERY OF ANCIENT ASTRONOMICAL RECORDS.—During Prof. Hilprecht's excavations at Nippur, a library, which it is estimated contains 150,000 tablets, has been discovered. Many of the tablets refer to ancient astronomical records, and it is expected that when these are finally translated, some remarkable facts concerning the state of astronomical knowledge during the period about 2300 B.C. will be disclosed.